SIGINT/Cyber Augmented Reality Glasses

The SIGINT Cyber Augmented Reality glasses is a TechSolutions funded-program managed by the ONR Code 30 Tactical Cyber Special Projects Area.

AT A GLANCE

WHAT IS IT?

A head-mounted augmented reality display to provide warfighters a stream of relevant mission data in his or her field of view to enable completion of critical tasks simultaneously.

HOW DOES IT WORK?

Most near-body applications execute (or interconnect) to a mobile device using COTS RF based communications (e.g., 802.11, Bluetoooth). Monitoring a mobile platform draws unwanted attention and impedes weapons handling. This technology will provide effective and covert display of near-body computing devices using inconspicuous augmented reality (sun)glasses.

WHAT WILL IT ACCOMPLISH?

Fusing real-time tactical data into a “heads-up” display will allow Marines at the tactical edge to conduct limited cyberspace operations without overwhelming them and or detracting from their battespace situational awareness, allowing them to complete multiple tasks simultaneously in support of the MAGTF.

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Today, warfighters carry many near-body devices:

- Sensors and collectors (e.g., cameras, SIGINT gear)
- Computing platforms (e.g., facial recognition)
- Health monitoring sensors

Data display, exchange and local processing across these (largely) single-purpose devices can provide increased situational awareness. The output of such local computing should be readily available to the warfighter, physically unrestrictive, effective, secure and covert.

As Marines conduct limited cyberspace operations at the tactical edge in support of the Marine Air Ground Task Force (MAGTF), the amount of data available to them can be overwhelming and may detract from their battlespace situational awareness (SA). Fusing real-time tactical data into a “heads-up” display will be a critical enabler. However, the display cannot distract a Marine from scanning the tactical environment and operating an assigned weapon system.

To meet the needs of the Marine operating at the tactical edge, the Osterhout Design Group (ODG) has partnered with ONR to develop and modify the X-6 System, which has 1280 by 720 stereoscopic see-through optics to provide a large screen virtual color display. The system has built-in 802.11 and 802.16 communications for the receipt and transfer of relevant data. For onboard processing, the glasses are built with an embedded , dual core 1.5 GHz processor. This enables the warfighter to conduct operations in remote environments without the need for a laptop or other processing devices. For power, the glasses have a rechargeable Lithium Ion battery pack, but they are also compatible with a BA-5590. All of this capability fits into a inconspicuous 4.5 ounce package that can be comfortably worn in extended periods under all conditions.

ODG developed the system to accommodate the needs of many users. For example, the X-6s have a weapons-mounted interface that will allow the warfighter to switch between left, right, and both side displays. With the see-through optics, Marines will be able to aim and accurately fire their weapon without distraction. The system also runs the Android Operating System (OS) version 4.0.X, which allows the glasses to run nearly all current and future Android applications. Warfighters will be able to easily deploy and test applications developed for any mission requirement.

Upcoming milestones...

- Revise application layout, text fonts, and text colors
- Acquire and integrate gov’t 802.11 survey software
- Add map mode (including map server infrastructure)
- Integrate ODG SDK features (e.g., contrast adaption)
- Evaluate ODG applications (e.g., 3D video)
- Exercise X-6 Glasses in Bold Alligator 2014

Research Challenges and Opportunities:

- Development of a weapons-mounted interface (WMI) holder for the Soldier Air Mouse, which will allow users to control the glasses display and data from their weapon
- Implement security measures to include Suite-B Data-At-Rest Encryption (Flash Encryption AES) Suite-B Data-In-Transit Encryption (AES/HMAC/SHA/IPSEC), and User Authentication (username/password)